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SCIENCE NEWS LETTER

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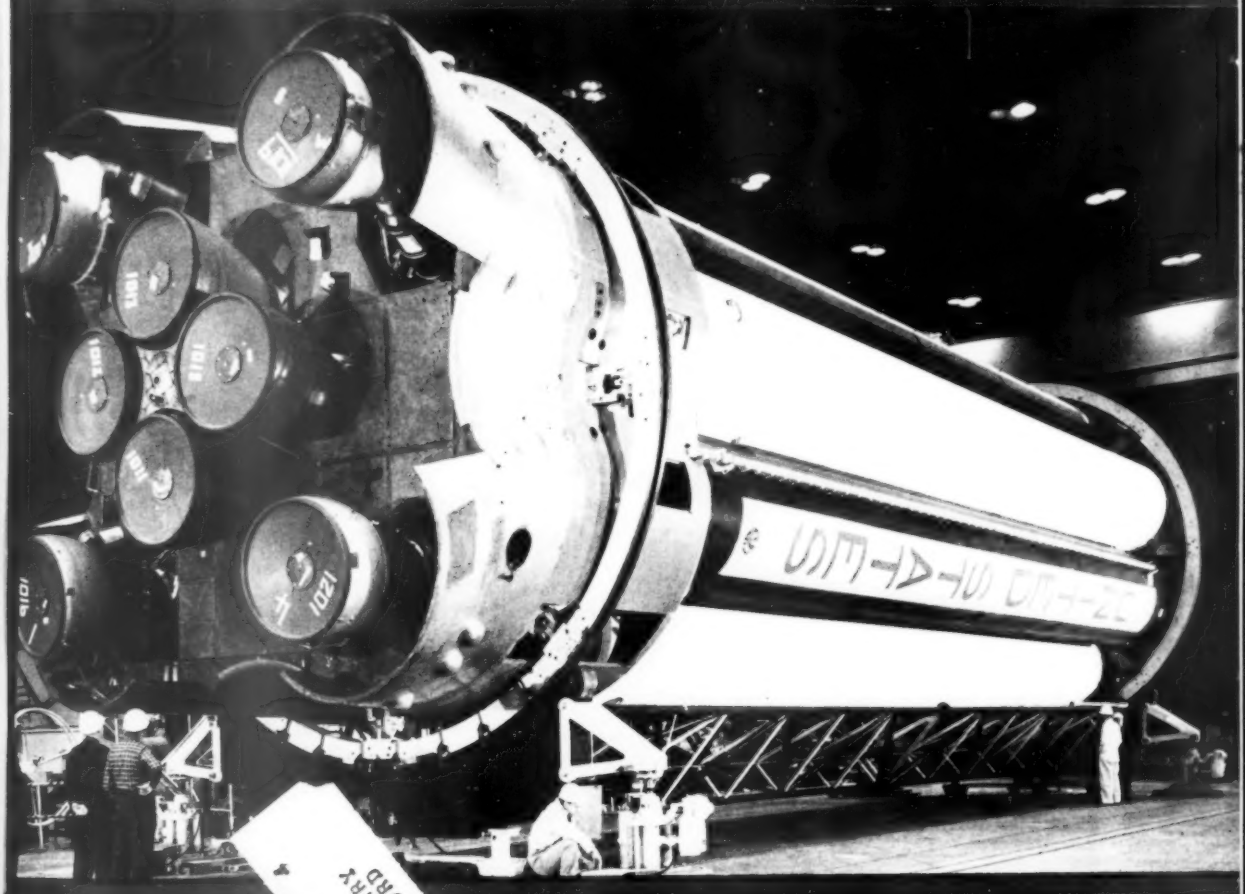

World's Biggest Booster

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NEUROLOGY

Tumors Safely Removed

Tumors of the hearing nerve can now be removed safely without permanent facial paralysis by repairing the damaged facial nerve with skin nerve grafting, Faye Marley reports.

➤ TOTAL REMOVAL of acoustic neuromas (tumors of the nerve of hearing) can now be done safely and without the permanently disfiguring facial paralysis that formerly accompanied such an operation.

A second operation in which the damaged facial nerve is repaired by skin nerve grafting can offset the facial grimace that follows the original surgery. The grimace is caused by cutting the facial nerve.

Prof. Norman M. Dott, senior neurological surgeon, University of Edinburgh, Edinburgh, Scotland, emphasized the early diagnosis of acoustic tumors, in the phase when deafness is the only symptom, in his talk at the Second International Congress of Neurological Surgery in Washington, D.C.

The importance of complete removal, Dr. Dott explained, lies in the danger that hydrocephalus, an accumulation of fluid in the brain, may develop. This complication is present among one-fourth of the victims of acoustic neuromas, who have partial removal of the tumor to preserve their facial nerve.

Dr. Dott, who was a student of the famous Harvey Cushing, classed in medical literature as the "greatest neurological surgeon in America," said that when Dr. Cushing operated on tumors of the acoustic nerve he would alternate between complete and partial surgery.

"I had one patient," Dr. Dott told SCIENCE SERVICE, "a naval officer, who feared facial paralysis so much that he chose to risk the dangers of hydrocephalus rather than have the tumor totally removed. But he was one of the lucky ones."

Fifteen or 16 successful skin grafts have been done at Edinburgh University, Dr. Dott said, where the surgeons take skin nerve from the patient's leg for grafting onto the facial nerves. There is no damage to the leg.

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Surgery for Epilepsy

➤ SUCCESSFUL surgical treatment for epileptics whose seizures could not be controlled with pills and other medication has been reported by a Japanese neurological surgeon.

Dr. Dennosuke Jinnai of the University of Okayama School of Medicine in Okayama told the Second International Congress of Neurological Surgery in Washington, D.C., that 12 patients, some of whom had been followed up for nine months, had been cured of the dangerous jerking that accompanied their seizures.

Patients who became unconscious during seizures could not be cured by the treatment, however.

Cat experiments preceded Dr. Jinnai's work on human patients. He theorized that the jerking movements of the head, torso and limbs in a major epileptic seizure required only a few of the many brain pathways sending messages to the muscles.

By dividing a small group of pathways located in the depth of the brain, Dr. Jinnai and his co-workers were able to stop the convulsive jerking induced by powerful seizure-producing drugs.

First they located the exact point of operation by injecting substances opaque to X-ray. A small opening was then made in the skull, and small amounts of a mixture of a certain oil in wax was injected. The substance produced a gradually developing zone of destruction.

Dr. Jinnai reported that the gratifying feature of his work was that no paralysis resulted to prevent normal activities in spite of the destructive surgery.

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Surgery Without Cutting

➤ RADIOSURGERY on the brain without opening the skull was reported by Swedish and American neurosurgeons speaking at the Second International Congress of Neurological Surgery in Washington, D.C.

Proton beams from cyclotrons at Harvard and at the Werner Institute in Uppsala, Sweden, have performed successful "operations" without making a skin incision.

"We hope to avoid the existing dangers of hemorrhage or sepsis," Drs. Raymond N. Kjellberg and William M. Preston of Massachusetts General Hospital, Boston, said. In this way the death rate from certain types of brain surgery may be reduced.

Dr. Lars Leksell of Stockholm, Sweden, reported using proton beams instead of surgery in cases of patients with shaking palsy (Parkinsonism), schizophrenia, the most common mental disorder, and with intractable pain.

The neurosurgeons cautioned that the scarcity and expense of the cyclotrons would make such treatment rare. Also, only a small number of brain disorders could be treated in this way.

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MEDICINE

Nobel Medical Award To Ear Authority

➤ THIS YEAR'S WINNER of the Nobel Prize in Medicine, Dr. Georg von Bekesy of Harvard University, is the world's leading authority on the functions of the ear.

The 62-year-old Hungarian-born scientist is senior research fellow in psycho-physics at Harvard and is not primarily a doctor of medicine although he holds an honorary M.D.

Dr. von Bekesy won the Nobel Prize for his work on the physical mechanism of stimulation within the cochlea, a cavity in the internal ear that resembles a snail shell. This cavity contains the important organs of hearing. These organs transform the vibrations received by way of the outer and middle ear into nervous impulses that are transmitted to the brain for translation into sound.

Hearing authorities say Dr. von Bekesy's outstanding contribution was in his development of the automatic audiometer in 1947, by which a person can trace his own minimal hearing level.

The von Bekesy type of audiometer is being used in hearing laboratories to develop tests for tumors of the auditory nerve. In this way a diagnosis of the cochlear and retrocochlear (behind the cochlea) functions can be made.

Dr. von Bekesy worked for many years in the research laboratories of the Hungarian Telephone System. He became interested, he once said, in the human ear when an economist asked him whether an improvement could be expected in the telephone system.

Another question of how much better is the ear than the telephone inspired him to glue tiny mirrors to the eardrum and record its response to sharp impulses. Then he pursued the problem into the inner ear itself, where he recorded and measured the traveling wave as it went along the ear membrane.

Among numerous awards Dr. von Bekesy has received was one of eight given in 100 years by the American Otological Society. The latest came coincidentally at the time the Nobel Prize of $48,300 was announced, when the Deafness Research Foundation in New York gave him its Merit Award Medal, Oct. 19.

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NOBEL PRIZE WINNER—in medicine, Dr. Georg von Bekesy of Harvard University.

SCIENTIA INTERNATIONAL

NOVAS DEL MENSE IN INTERLINGUA

Astronautica.—Le Instituto Memorial Battelle de Columbus, Ohio, annuncia le perfectionamento de un cellula electrolytic in que le separation de hydrogeno e oxygeno ex aqua non depende del gravitate (como il es le caso in cellulas de electrolyse conventional). In le nove cellula le fortias de gravitate es reimplaciate per le fortias generate in rotation. Un altere apparato Battelle reduce bioxydo de carbon ad in aqua e carbon. Insimul le duo apparatos, placiate in un astronave, representarea un systema pro le regeneration de inhalabile oxygeno ex le exhalate bioxydo de carbon.

Communicationes.—Al Congresso Astronautic International a Washington, le britannic physico e litterator Dr. A. C. Clarke de Colombo, Ceylon, ha explicate su prediction que le imminente inclusion del mundo integre in un systema de satellites de telecommunication va resultar in le reduction del nunc existente 6000 linguas a non plus que tres. Iste tres, crede Dr. Clarke, va esser le chinese, le anglese, e le russo. Un forma de chinese es parlate naturalmente per 15 pro cento del homines. Un forma de anglese es parlate naturalmente per 10 pro cento del homines. Le numero total del homines qui comprende le anglese excede per multo le numeros de illes qui comprende le chinese o le russo.

Computatores Electronic.—Dice Dr. H. Wooster, chef del division de scientias informational in le bureau de recercas scientific del statounitese Fortias Aeree, que reguardar un computator como un "cerebro electronic" es pauco plus plausibile que insister que un stilo e un pecia de papiro pensa o scribe poemas. Le periculo—popularmente discutite de tempore in tempore—que computatores poterea arrivar un die a insclavar intellectualmente lor creatores human es non-existente. Le ver periculo, secundo Dr. Wooster, es que perfectionate computatores va poter digerer e raffinar massas si enorme de datos que le productos de lor calculationes excedera le capacitates receptive del homine. Quanto al programmas de perfectionamento futur del computatores, Dr. Wooster exprime le concepto que—ben que le studio del functionamento del cerebro human va certo esser de interesse pro le ingeniero de computatores—il non es probabile que meliorate computatores va imitar in lor structura le structura del cerebro. Post toto, dice Dr. Wooster, in cercar a perfectionar nostre machinas de volo nos non tenta a equipar los con plumas.

Ingenieria Electronic.—In le laboratorios del Corporation Burroughs, le modello de un miniaturisate computator electronic esseva construite, con le dimensiones de un cassa de cigarros sed con le potentias (in le solution de certe typos de problemas) de un machina traditional del dimensiones de un wagon de ferrovia. Le importantia de iste prime modello de su genere es que illo demonstra definitivemente le possibilitate practic de utilisar computatores liberemente in vehiculos de aero-e cosmonavigation.

Inventiones.—Es reportate que le industria electronic russe ha disveloppate un "machina a dormir" que intensifica le profundor del somnio del individuo de maniera que ille pote functionar efficacemente con solmente duo horas de reposo per die. Le machina ha un peso de cinque libras. Illo exerce su influentia per le application de pulsos electronic al temporas. Milles e milles de russos, le reporto explica, possede iste machina (e travalia 22 horas per die).

Morbos Cardiovascular.—Le datos colligite per le anthropologo american Dr. G. D. Gibson in le curso de un sojorno de novem menses inter le hereros del sud de Africa include le constatation que, ben que carne e grassia animal es le plus importante alimento de ille tribo, morbo cardiovascular es rar. Il remane a determinar si iste observation conflige vermente con le these que dietas ric in grassia animal promove le deposition de cholesterol in le arterias e assi le incidentia de morbo cardiovascular o si altere factores (per exemplo de genere genetic) establi le caso del hereros como un caso special.

Physica Atomic.—Un recente expedition marin del Institution Oceanographic Woodshole pare haber constatate que le precipitation radioactive post explosiones atomic es tres vices plus intense supra le oceanos que supra regiones de terra firme. Nulle explication de iste facto es currentemente cognoscite.

Physiologia.—Quaranta-octo de 53 patientes con perdita del senso olfactori se restabliva post massive injectiones intramuscular de vitamina A, secundo un reporto de Drs. M. H. Briggs e R. B. Duncan del Universitate Wellington, Nove Zelandia. Experimentos con le areas olfactori de bestial recentemente abattite habeva revelate que ille areas es normalmente ric in carotenoides e vitamina A sed que defectos del senso olfactori es associate con deficientias del carotenoides mentionate. Il existe un connexion moleculo-structural inter vitamina A e le carotenoides.

Poliomyelitis.—Dr. D. Bodian del Universitate Johns Hopkins opina que gratias al vaccino Salk, poliomyelitis es hodie un minor problema de sanitate in le Statos Unite e que—per consequente—un utilisation in massa e systematic del vaccino Sabin non es justificate. Dr. Bodian crede que ambe vaccinos ha lor placia in le armamentario anti-poliomyelitic e que il es contra le spirito de un democratia (e del scientia) de imponer le uso del un e jugular le uso del altere.

Radioecologia.—Al prime Symposion de Radioecologia a Fort Collins, Colorado, Dr. E. P. Odum del Universitate Georgia reportava su discoperta que insectos elimina artificialmente administrate radio-isotopos plus radidemente si illos ha ingerite succo de plantas salvage. Iste remarcabile virtute de succo de plantas salvage merita esser investigate additionalmente.

Recercas de Cancere.—Le injuriation del pelle que resulta del roentgeno-irradiation therapeutic usate in le tractamento de cancere cervical pote esser reducite considerabilemente per frigidar le pelle durante su exposition al energia ionisante. Un gruppo de medicos del Universitate Chicago ha utilisate a bon successo un simple systema de aqua circulante pro le mentionate objectivo.

Statistica Vital.—Dr. A. J. Coale del Universitate Princeton ha calculate que le nunc prevalente rhythmo de augmento in le population del Statos Unite producerea—si non relentate—un milliardo de americanos in minus que un seculo, un americano per pede quadrate de territorio in 650 annos, e un peso total de americanos in excesso del peso del terra in 1700 annos.

Textiles.—Aciero inoxydabile pote esser tirate in filos de un tenuitate de duo vices illo de capillos human. Tal filos ha jam essite usate a bon successo in le fabrication de pannos, e il non pare impossibile que le vestimentero del futuro va vender vestimentos de aciero si ben que de fibras synthetic. Forsan vestimentos de lana e de coton va etiam remaner disponibile.

GENERAL SCIENCE

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MEDICINE

Save Mothers and Babies

▶ RADIOACTIVE ISOTOPES can now diagnose placenta previa, a serious complication of the birth process, in time to save the lives of mothers and babies.

The placenta, which connects the mother with her unborn baby to permit passage of food, oxygen and waste products, is normally located above the fetus. But in placenta previa it is attached to the lower part of the mother's uterus near the birth canal.

Medical literature reports approximately one out of 200 pregnancy cases show this complication, with a high mortality rate for both mother and child.

Now, by introducing radioactive iodine into the mother's blood stream and applying an isotope counter to locate the placenta from its heavy concentration of blood, the condition can be discovered in time for treatment.

The treatment includes blood transfusions as needed, confining the patient to bed and performing Cesarean section for all but the most minor degrees of placenta previa.

Drs. Denis Cavanagh, Charles E. Powe and Albert J. Gilson of the University of Miami School of Medicine and Jackson Memorial Hospital, Miami, Fla., report a new study in Obstetrics and Gynecology, Oct., 1961, official journal of the American College of Obstetricians and Gynecologists.

The investigators report accurate vertical location of the placenta in 29 of 30 mothers studied by using radioactive iodine.

They also say that during a three-year period, 632 women were admitted to Jackson Memorial Hospital with bleeding symptoms during the last three months of pregnancy, of whom 80 had placenta previa, but none died with this complication. Four out of five babies were saved.

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PUBLIC HEALTH

Fallout Less Than in 1958

▶ THERE IS LESS fallout now in the United States from the recent Soviet nuclear explosions than immediately resulted from the series of nuclear tests by the United States and the United Kingdom in 1957-58. But this does not mean that the Soviet explosions are either "cleaner" or less of a health hazard than the Western tests.

It only means that most of the Soviet tests were in excess of 1,000,000 tons of TNT (1 megaton) and thus were powerful enough to inject the radioactive debris into the upper atmosphere, the stratosphere, Dr. Lester Machta of the U.S. Weather Bureau told SCIENCE SERVICE. The contaminated particles, including the cancer-causing strontium-90, produced by the 19 Soviet tests, will remain in the stratosphere until late winter or early next spring when seasonal exchanges of air in the atmosphere, and precipitation occur. Only a very small fraction, perhaps only one percent, has settled to earth.

Most of the U.S. and U.K. 1957-58 tests were in the lower atmosphere, the troposphere, and the debris settled to the ground quickly. However, larger Soviet tests in 1958, as well as some by the West, sent debris into the stratosphere. This was washed down in the spring of 1959, accounting for the sudden rise in radioactive fallout reported then.

Next year's spring showers, therefore, will bring larger amounts of the dreaded fallout as well as the more welcome flowers, Dr. Machta predicted. Greater concentrations of strontium-90 as well as other harmful radioactive elements probably will settle in the northern areas of the world. These will include the Scandinavian countries as well as Canada where presently high levels of radiation are causing official concern. Reports are that the Red Chinese also have expressed concern to the U.S.S.R.

In hearings before the Joint Committee on Atomic Energy in 1957, a seminar of scientists suggested that the maximum permissible release of radiation from nuclear explosions into the worlds' atmosphere be limited to that from 10 megatons. The tests by the United States, Great Britain and the Soviet Union in 1957-58 alone reached a total of 35 megatons. The present Soviet series has been estimated at over 10 megatons, bringing the total of known nuclear explosions since 1957 to 45 megatons. Much of the resulting debris such as cesium-137, carbon-14 and strontium-90, are potentially harmful and the latter two are long-lived.

How dangerous is this fallout to the total population? According to the U.S. Public Health Service, "at present fallout levels in this country, and for that matter even at considerably higher levels, this risk in the total group is relatively small and since this total risk is divided among all the exposed persons the hazard to any single individual is extremely small."

The Public Health Service, however, has noted that fallout is neither uniformly distributed throughout the earth nor uniformly absorbed by each individual. Therefore, the hazards will vary from place to place and from individual to individual.

The risks from absorption of strontium-90, a cause of leukemia and bone-cancer, are infinitely greater in infants and children whose calcium formation is not complete. Experiments have shown that even low-level doses of radiation are harmful to the nervous systems of the more highly developed animals, such as man. The hazard of genetic damage from cesium-137 and carbon-14 is greater for the unborn child.

According to Dr. Linus Pauling, distinguished biochemist and Nobelist, exposure to cesium-137 resulting from the Soviet tests, could result in 160,000 children being born in the next few generations with physical and mental defects. The carbon-14 debris might cause in the next 12 generations as many as four million stillbirths, embryonic, neo-natal or childhood deaths, and living children with physical or mental defects.

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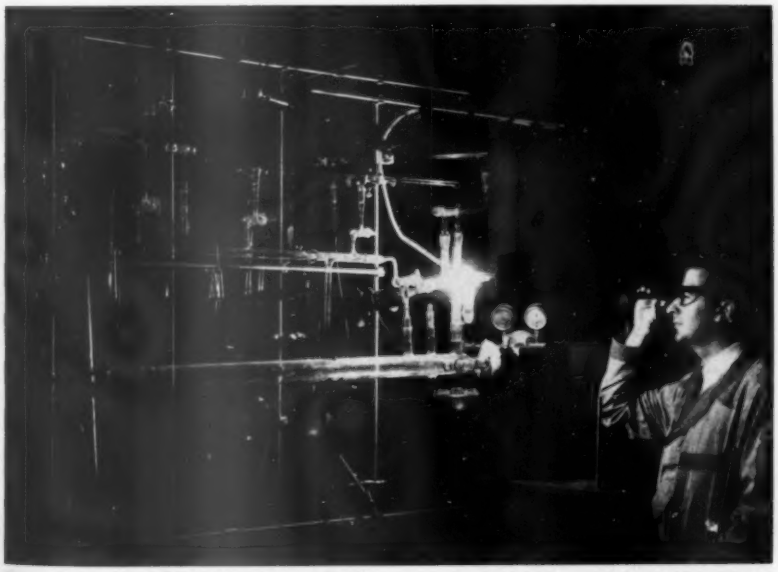

HOT-COOL GAS—The effect of plasma, an ionized gas capable of conducting an electric current, on such chemicals as nitrogen, hydrogen, oxygen and nitric oxide, is studied by Dr. Gene G. Mannella at the Battelle Memorial Institute, Columbus, Ohio. The "low-temperature" plasma is estimated at more than 10,000 degrees Fahrenheit.

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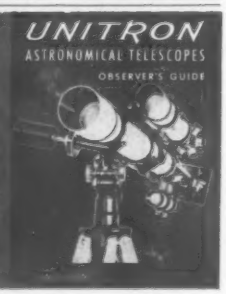

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SPACE

G-Forces Affect Brain

➤ TREMENDOUS vibrations and g-forces of rocket boosters may cause astronauts to become temporary epileptics under certain conditions.

This is suggested in studies at the University of California, Los Angeles, Brain Research Institute.

The investigation was part of the space biology program being carried out at the UCLA Medical Center with the support of the U.S. Air Force and U.S. Public Health Service. Collaborating in the study were Dr. Ross Adey, Dr. John French, Raymond Kado, David Lindsley, D. O. Walter, Dr. Richard Wendt and Dr. W. D. Winters.

Monkeys and other experimental animals were subjected to acceleration and vibrational effects during centrifuge and shaker apparatus experiments. These effects are comparable to those of rocket booster forces.

Deep brain wave recordings of the animals were made during the experiments with a special transistorized electrocardiogram unit designed for satellite biopacks. The recordings showed erratic electrical discharges from the temporal lobe area of the brain characteristic of epileptic seizures.

It was suggested that the extreme vibrations "drive" the normal rhythms of the brain to abnormal discharges. The effect is probably only a temporary one, Dr. Adey said, but it could prove critical in an astronaut's performance in space.

Such seizures may not be apparent on a television monitor, Dr. Adey points out. They are characterized by a sudden interruption of the stream of consciousness. Epileptics frequently have these seizures without obvious signs.

Centrifuge studies were carried out in the University of Southern California's human centrifuge facility and the American Testing Laboratory's shaker apparatus.

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INVENTION

Patents of the Week

➤ THE INVENTION of a split-level station wagon may make matching homes and cars the latest fashion in suburban living.

The wagon, awarded patent No. 3,003,808, features an "easily accessible" raised compartment for passengers, with seats that can open out into a bed. Travelers reach the compartment by walking through rear side doors located on the first level, then stepping onto a deck that forms the second-level floor.

Baggage may be stored between the deck and the first-level floor, as well as in a compartment located behind the rear wheels. Inventor John H. Swanberg of Minneapolis, Minn., said that a conventional station wagon, when carrying a full load of passengers, must store luggage on an exterior top rack, thus raising the center of gravity and making the wagon harder to control. The split-level design provides ample space inside.

Among the other advantages claimed for this two-level traveler is a "superior view of the scenery" for passengers occupying the upper level. Observation windows and windshields, located in the passenger compartment, also offer excellent visibility.

Perhaps the wagon's most attractive feature is its capacity to segregate the driver from chatty passengers, to avoid distractions and to do away with back-seat driving.

A device to protect split-level station wagons or any other car from theft was invented by Arnold Greenspan of Newark, N.J. He was awarded patent No. 3,004,170 for a connection device "capable of economical installation in existing vehicles of a wide variety of makes and models."

Various essential parts of the car's electrical system are plugged into the device, which consists primarily of a removable plug, necessary for establishing the required connections. Without the plug—or a diagram and complete knowledge of the theft-protection system—no unauthorized person would be able to use the car.

Patent No. 3,003,873 was issued to Vladimir K. Zworykin, Princeton, N.J., who invented an improved method of manufacturing color-kinescopes. The radio-television pioneer assigned the rights to the Radio Corporation of America.

An emergency power system for submarines was patented by Shelton M. Gay Jr., Vienna, Va. Rights of patent No. 3,003,448 were assigned to PneumoDynamics Corporation, Cleveland, Ohio. High water pressure due to the submarine's depth pushes sea water through various inlets driving a hydraulic motor. The water is exhausted into water-tight compartments within the sub.

The emergency power system would be used while repairs are being made or to operate an escape mechanism.

Underground water can be traced by using thiocyanate ions, according to John L. Boyd, Tulsa, Okla. Mr. Boyd was awarded patent No. 3,003,856 for his invention, assigned to Sinclair Oil & Gas Company, also of Tulsa.

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DENTISTRY

Tooth With Lost Nerve Should Serve for Years

➤ A TOOTH that has lost its nerve need not be pulled from a person's mouth, the American Dental Association in Philadelphia was told.

Extraction of a tooth because a nerve is diseased will not be necessary in the future, Dr. Milton Siskin of Memphis, Tenn., said. If the nerve or pulp is completely removed and the inside of the tooth is sterilized, the tooth should last as long as any other. The dentists call this "endodontics."

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SPACE

Radiation Belts Sought

▶ THE DISCOVERER of the earth's radiation belts, Dr. James Van Allen, is now on the track of radiation zones circling close above the polar region.

Dr. Van Allen, head of the physics department, State University of Iowa, Iowa City, told SCIENCE SERVICE that satellite experiments now underway could show if the dumping of trapped particles in the aurora zones, causing the spectacular northern lights, come from separate radiation belts or originate from the radiation belts already discovered.

He said measurements have already been made by the Injun satellite sent aloft June 29 with the navigational satellite Transit IV-A. Experiments have also been carried in the Explorer XII satellite for measuring these particles and soon a new Injun satellite will be launched with more advanced equipment to continue the studies.

Dr. Van Allen told newsmen at the American Rocket Society meeting in New York that many space scientists lack basic competence. He suggested that the Government support basic research in universities in the form of facilities and fellowships to offset this shortcoming. He said $2,000 and tuition fees should be the bare minimum for fellowships and added that $100,000,000 a year would be a generous appropriation for university space research. As of now, no appropriations for such purposes have been made by the United States Congress.

He recommended that undergraduate students intending to go into space science should have thorough training in basic sciences such as mathematics, physics and classical mechanics. On the graduate level, Government-sponsored programs in space research could give future space scientists a solid foundation for work in the field. He said there are now not more than 25 "real pros" in space sciences, whereas in the field of physics, there are at least a thousand. Most of the scientists in the space field are "transplants" from other fields.

Dr. Van Allen says he hopes work done in the next few years will bring knowledge of the influence of radiation belts on weather, on magnetic storms that interfere with communication, and show whether the planets are surrounded by radiation belts similar to those circling the earth.

The radiation from the Van Allen belts is considered dangerous to space travelers. However, Dr. Van Allen said the greatest danger to man in space is radiation from the sun during solar storms, which cannot be predicted at this time.

He said the Explorer VII satellite showed 21 solar events occurred in 17 months, but out of these, only one, from Nov. 12-16, would have been fatal to man outside the earth's shielding atmosphere. He added, a man in space at that time would have needed more than one inch of aluminum shielding, or one ton per person, to withstand the lethal effects.

The shielding problem is difficult at this time because of the present limited lifting capacity of space boosters. Man will have to take his chances if he goes into space now or wait until enough shielding can be provided, he said.

Dr. Van Allen, who received the Rocket Society's first annual research award of $2,500, feels that on the whole the U. S. is ahead of USSR in scientific space achievement despite a few spectacular Russian achievements.

• Science News Letter, 80:287 October 28, 1961

SPACE

Saturn Shot Scheduled

See Front Cover

▶ THE WORLD'S largest known rocket, the U.S. Saturn, will zoom 90 miles into space soon.

This is the first of ten scheduled test firings of the 162-foot Saturn C-1 rocket. The tests are expected to lead to operational Saturn C-1 rockets in 1964 and more advanced models shortly thereafter, the National Aeronautics and Space Administration reported in Washington, D.C.

The C-1 Saturn model is scheduled to send three men on a whirl around the earth in the Apollo capsule. The advanced Saturn is designed to take a three-man crew around the moon and return them to earth. The trip will be a test for later lunar landings of manned spaceships.

The main purpose of the first Saturn shot, to be known as the SA-1, is to test the propulsion system and the booster, also called the first stage. It is also hoped the flight will prove the design of the whole vehicle in flight and the launching equipment.

Only the first stage of the first Saturn rocket will be "live," carrying fuel. The two upper stages will be ballasted with water to give them the weight they would ordinarily have when carrying propellants. The probable path traveled by the rocket from launch to finish is about 225 miles. The flight is expected to take around eight minutes with speeds up to 3,700 miles per hour.

The development of the Saturn has presented a multitude of problems because of the rocket's size. The general field of rocket technology has received a great boost from the work carried out on it.

The Saturn program is under the technical direction of the NASA Marshall Space Flight Center, Huntsville, Ala., whose scientists are optimistic about the outcome of the project, although setbacks are anticipated along with successes. Five successful launches are expected from the ten scheduled test launchings.

At lift-off, the first Saturn will weigh about 925,000 pounds and will be fired by eight H-1 engines. Each engine will have a thrust of 165,000 pounds, giving the first stage a total of 1,300,000 pounds of thrust.

The booster, seen on the front cover, will carry 600,000 pounds of propellant, which is 150,000 pounds less than its maximum carrying capacity. The second stage weighs 25,000 pounds and will carry 90,000 pounds (almost 11,000 gallons) of water as ballast. The upper stage weighs 3,000 pounds and will carry 100,000 pounds (12,000 gallons) of water.

The dummy payload, a nose section of a Jupiter missile, weighs slightly more than a ton. This payload will in operational flight be substituted by the Apollo capsule carrying astronauts into an earth orbit and, later, to the moon.

The two first stages were made at the Marshall Center. General Dynamics/Astronautics provided the third stage. The "live" second stage to be used in later Saturn rockets is being developed by Douglas Aircraft Co. All stages were transported by water from Huntsville to Cape Canaveral, Fla.

The rocket was erected on its multi-million-dollar launch pad late in August. Since then the giant space vehicle has been checked and prepared for launch.

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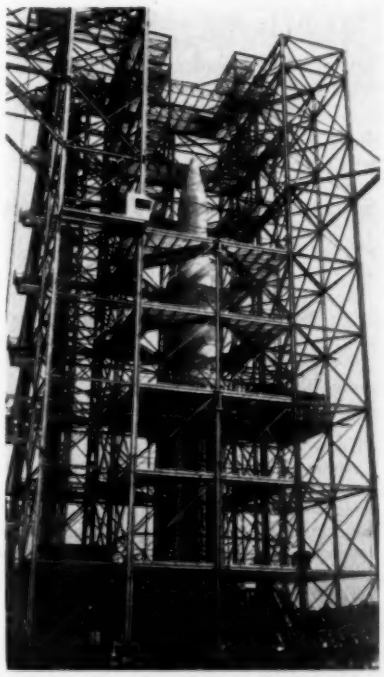

LARGEST KNOWN ROCKET— The first Saturn C-1 during vibration tests at NASA's Marshall Space Flight Center, Huntsville, Ala.

MEDICINE

Female Fertility Induced By Experimental Drug

➤ NEW HOPE for barren women is seen in a new experimental drug.

The drug, known as MRL/41, has induced egg-producing menstruation in 28 (75%) of the women treated for abnormal absence of the monthly cycle. Four became pregnant.

The important feature of MRL/41 is its apparent ability to modify the hormonal balance between the pituitary gland and the ovaries. The pituitary in the brain produces hormones that stimulate the ovaries, a function essential to conception.

One puzzling point revealed in the study was that experiments on rats, which preceded the clinical tests, showed exactly opposite results. In both male and female rats, previous reports had suppressed both ovulation (egg production) and fertility (ability to reproduce).

No serious toxic reactions involving the blood, kidneys or liver occurred, researchers said. However, there were some adverse effects among patients during treatment with the drug, such as rashes and hot flashes.

MRL/41 is structurally related to chlorotrianisene, a synthetic female sex hormone, but it does not exhibit the expected activity in humans.

Results of the research were a surprise to the investigators. The drug holds much promise, but will not be available for prescription until further research is done, it is reported in the Journal of the American Medical Association, 178:101, 1961.

Drs. Robert B. Greenblatt, William E. Barfield, Edwin C. Jungck and Albert W. Ray of the Medical College of Georgia, Augusta, are reporting the study.

• Science News Letter, 80:288 October 28, 1961

PUBLIC HEALTH

Fight for Purer Air Shows Nation-Wide Gain

➤ THE WAR against air pollution is gaining momentum on a nation-wide scale.

Recent developments in the growing campaign for fresher, cleaner air include approval by California's Motor Vehicle Pollution Control Board of a "blow-by" antismog attachment for automobiles. This is the first step toward putting teeth in a state law requiring pollutant trapping devices on all new cars sold in California.

Although the Automobile Manufacturers Association reports the new unit is being installed on autos due for California sale, the law cannot be enforced until the board has approved at least one other system. Two more are expected to be approved, however, by the end of 1961.

The first board-accepted unit was developed by the AC Sparkplug division of General Motors.

Meanwhile, in Pittsburgh, Pa., blow-by control devices have been installed on county-owned vehicles for testing and evaluation. Legislation making the units mandatory for all vehicles in Allegheny County could follow. Motor vehicles pour an estimated 660 tons of pollution into the Pittsburgh atmosphere each day.

City and county officials in the New York metropolitan area are urging the start of a tri-state (New Jersey, Connecticut, New York) smog alert system similar to smog-ridden Los Angeles and based on continuous measurements of pollutants in the air at key locations. High pollution levels, a definite health menace, would set off voluntary anti-pollution action by industry, business, government and the public.

At its annual meeting, held this year in Chicago, the National Association of County Officials recommended several pollution-reducing policies. They called for Federal aid to research programs, a rapid tax write-off on control equipment, installation of blow-by units on all autos manufactured for U. S. sales, and a White House air pollution conference in 1962.

In Washington, Abraham Ribicoff, Secretary of Health, Education and Welfare, has asked the automobile industry to install blow-by devices without waiting for compulsory legislation.

Pollution costs about $7.5 billion in economic damage annually, but money spent for control measures totals only about $8,000,000. More than half of this is spent in California.

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MEDICINE

Blood Types Related To Ulcer Incidence

➤ PERSONS with O type blood and a certain combination of Rh factors are more likely to develop ulcers.

This points to a genetic, or hereditary, aspect of the disease, Dr. Joseph A. Buckwalter of the State University of Iowa said at the two-day conference on management of peptic ulcer at the New York Academy of Sciences, New York.

Dr. Buckwalter found that persons with O type blood were more prone to gastric and duodenal ulcers than those with types A, B, or AB. The study was made on more than 3,200 ulcer patients.

Dr. Joseph B. Kirsner of the University of Chicago also pointed out the possibility of a genetic predisposition to ulcers.

Both speakers noted that ulcers occur more frequently among persons who do not secrete a certain group of water-soluble chemicals in their saliva. The chemicals, known as ABH substances, are genetically controlled.

Hydrochloric acid is no longer in question as a cause of peptic ulcer, Dr. Kirsner said, although the "precise biochemical events in the secretion of hydrochloric acid remain incompletely understood."

There have been no striking advances in ulcer treatment. The value of the many substances claimed to help the condition still must be proved.

Patients are still advised to avoid irritants in diet, drugs and drink, to take drugs that will control gastric acidity, to eat often and avoid emotional difficulties. Less radical surgery is now being done than formerly.

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IN SCIEN

SURGERY

Infections Still Follow Surgery Despite Drugs

➤ INFECTIONS still follow abdominal operations in spite of modern drugs.

Increasing resistance of bacteria to the new antibiotics is the important factor causing persistent postoperative infections.

Dr. Edward J. Krol of Holy Cross Hospital, Chicago, reports in the American Journal of Proctology, 12:297, 1961, that 53 of about 10,000 major abdominal surgical cases in that hospital resulted in infections.

"These figures," he states, "in comparison with the over-all figures of the country, seem to be very low."

Staphylococcus aureus was the most frequent offender among the bacteria, Dr. Krol states.

The oxytetracycline antibiotics were reported most effective in studies of treatment of such infections in hundreds of cases throughout the United States.

Injected penicillin caused 83 deaths among 1,070 cases of adverse reaction to antibiotics, but no deaths occurred when patients took oral penicillin.

These cases were reported in an extensive survey covering 800 hospitals over a three-year period. A diseased state of the blood resulted in aplastic anemia causing 23 deaths. Chloramphenicol, another antibiotic, was associated frequently with these fatalities.

Dr. Krol advises surgeons to work more closely with bacteriologists to combat the postoperative infection problem.

Surgical bacteriology, he adds, still maintains its position of relative importance in clinical surgery.

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MEDICINE

Kidney Stone Drug Saves Lives of Paraplegics

➤ A DRUG THAT DISSOLVES kidney and bladder stones without irritation can save the lives of many paraplegics, Dr. William P. Mulvaney, University of Cincinnati College of Medicine, reported to a sectional meeting of the American Urological Association in Cincinnati.

Paraplegics are patients with paralysis of the legs and lower part of the body. Kidney or bladder stones form in almost every paraplegic, Dr. Mulvaney said. They account for 30% of the deaths of these patients.

Daily irrigation with the drug, Renacidin, can prevent the formation of such stones in paraplegics, in weakened patients and in those with only a single kidney.

When a stone already exists in kidney or bladder, Renacidin either dissolves the stones or softens them so that they can be crushed with an instrument.

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NE FIELDS

MEDICINE

Severe Retardation In Children Avoided

➤ AN EARLY diagnosis of a brain-damaging condition is now possible in time to prevent severe mental retardation in hundreds of children each year.

Dr. Robert Guthrie of the University of Buffalo reported at the annual convention of the National Association for Retarded Children in San Francisco that a simple blood test can be given to all newborn babies to find out if they have phenylketonuria (PKU), a cause of mental retardation.

At least one percent of the 200,000 mentally retarded patients now in institutions are victims of PKU, a metabolic disease treated with a milk-free diet.

Phenylketonuria occurs, Dr. Guthrie explained, when an excessive amount of phenylalanine (an amino acid) in the blood produces a strong acid in the urine. Too much of the acid in the body eventually damages the brain.

With methods available up to now, testing of babies does not take place until the acid becomes evident six weeks after birth, at which time brain damage has already taken place.

A hunt for PKU babies is in progress in many parts of the country where attempts are being made to locate such children in time to prevent mental retardation. The diet should start before the child is a month old to prevent any brain damage taking place.

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PHARMACOLOGY

Nerve Hormone Restores Lost Effect of Drugs

➤ INJECTION of a certain nerve hormone will restore the strength of drugs that lose their effectiveness after being given repeatedly.

Drs. F. F. Cowan, Theodore Koppanyi and Carolyn Cannon and G. D. Maengwyn-Davies of Georgetown University's department of pharmacology report in Science, 134:1069 and 1075, 1961, their findings of a study on animals. They expect to start another study on humans in the near future.

The investigators found that the nerve hormone, norepinephrine, restored lost response, at least partially, to amphetamine (Benzedrine), ephedrine and tyramine. These are drugs used to stimulate circulation in cases of low blood pressure.

Norepinephrine, a powerful constrictor of blood vessels that come from nerve ends, is manufactured by the adrenal gland and by some nerves. It has been synthesized for sale commercially.

In an interview, Dr. Koppanyi told SCIENCE SERVICE that the above-mentioned drugs as well as many others owe their action to release of a nerve hormone to the muscles or glands.

"Such drugs, therefore, may be said to act indirectly," Dr. Koppanyi explained. "If nerve hormones are completely depleted by such drugs, these drugs can no longer be effective."

The investigators decided it was reasonable to assume that the replacement by injection of the nerve hormones will restore the effectiveness of these drugs.

The problem was also attacked by giving bretylium, an agent that blocks the release of norepinephrine from the nerve ends. Bretylium was once used to treat high blood pressure. It may be useful, however, in preventing the gradually diminishing effects of ephedrine and similar drugs on the heart and blood pressure.

This is the first time that gradual diminishing drug effects have been prevented in the living body, Dr. Koppanyi said.

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TECHNOLOGY

Mobile Vans May Help Fight Heart Disease

➤ MOBILE VANS similar to those in which X-rays have been taken to help in the war against TB may soon carry the fight to heart disease, the number one killer in this country.

Tape recordings of heart sounds, made by equipment carried aboard the vans, could then be fed to a computer and analyzed for further checkup by doctors.

Charles E. Bading, staff engineer of International Business Machines Corporation, Kingston, N.Y., told SCIENCE SERVICE that he and his co-workers hoped to get public health officials' approval of the vans.

The powerful IBM computer 704 is now being used in analysis of phonocardiograms, it was reported at the Third Annual Medical Symposium sponsored in Endicott, N.Y., by the International Business Machines Corporation.

Mr. Bading said that physicians could be helped in speeding up analysis of heart abnormalities through use of the computer.

Agreeing with the engineer was Dr. David S. Gerbarg, attending physician at Kingston Hospital, who for the past two years has aided with medical advice on recordings desired for computer analysis.

"Already tape recordings of heart sounds of 30,000 school children in Chicago have shown in a five-year study that four out of every 1,000 children have heart abnormalities," Mr. Bading said. "Many were unsuspected."

The IBM studies so far have been on normal hearts, using tape recordings of the "lub and dub" of the heart beat. The physician advises on murmurs that might occur in the systole contraction and the diastole relaxing of the beat.

"We are not trying to do anything the physician himself cannot do," Mr. Bading explained. "However, we can save much labor in listening to individual heart beats that may be perfectly normal."

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DENTISTRY

Automatic Toothbrush For Flabby Generation

➤ THE FLABBY generation apparently has come to the point where an automatic toothbrush driven by electricity has become the subject of serious dental research.

Dr. John W. Hein, dean of Tufts University Dental School, Boston, where some of the research was conducted, told the American Dental Association convention in Philadelphia that an ordinary toothbrush properly used will be effective.

However, the public does not "ordinarily expend the time and effort necessary to extract a high degree of efficiency from hand brushes," he said.

Children with poorly aligned teeth showed a 41% improvement in plaque removal and 32% in debris removal over the hand brush, Dr. William Lefkowitz of the University of Kansas City (Mo.) Dental School reported.

Plaque is the gelatinous substance that forms on teeth and which can harbor bacteria.

In the Kansas City test school children from seven to 12 were tested after a colored solution adhering to the plaque was placed on their teeth.

On one day the children used ordinary toothbrushes, and on the next they used electric brushes. The automatic toothbrush did a better job of both plaque and debris removal.

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SPACE

Spaceman Can Reduce Error in Reckoning

➤ MAN IN SPACE will be able to tell whether he is coming or going relative to any object he may be passing. It will, however, take special training to accurately estimate the rate at which he will approach an object in order to determine when he will make contact, an Air Force scientist told the Air Force's 8th annual Symposium on Science and Engineering in San Francisco.

There seems to be a built-in error in man relative to making such estimates, Charles A. Baker, Air Force Systems Command psychologist from the Aerospace Medical Laboratories, Wright-Patterson Field, Ohio, said. It was evident in 50 subjects tested.

Unless man is trained to overcome this error, it will be difficult to rendezvous in space to exchange crews, assemble satellites or make satellite repairs. Such activities will be essential when space flight is developed to a point where it is fully operational, the scientist said.

Experiments have shown that this error can be overcome. As little as ten hours of training under simulated space conditions dramatically reduced errors by as much as 70%. Indications are that more extended training may reduce error even more. The training is done without any optical aids.

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ASTRONOMY

Look for Jupiter Early

Jupiter can still be seen in the evening sky during November in the constellation Capricornus. The winter constellations are making their appearance, James Stokley reports.

➤ THE PLANET Jupiter is still prominent in the evening sky during November, but you have to look soon after the sky darkens. Only two months ago it was visible until midnight, and even into the early morning. But at the beginning of November it sets soon after 10:00 p.m., your own kind of standard time; and about 8:30, at the end of the month.

If you look earlier in the evening—even before the sky is entirely dark—you will see it in the southwest, in the constellation of Capricornus, the horned goat. It is so much brighter than any other planet or star now visible (magnitude minus 1.8 on the astronomer's scale) that it appears first. And a little ahead of Jupiter, toward the right, stands another planet—Saturn. It is about an eleventh as bright as Jupiter, although still equal to a first magnitude star.

Neither Jupiter nor Saturn are shown on the accompanying maps of the November evening skies. These depict the heavens as they look about 10:00 p.m. at the first of November, about 9:00 at the middle of the month and 8:00 at the end. Thus, these planets are just below the southwestern horizon. But the stars make a brilliant display, for we are beginning to see some of the constellations that make the evening skies of winter so glorious.

For example, look over toward the east. There, a little above the horizon, you will see three moderately bright stars in a vertical row, with brighter stars to the right and left, and another quite a bit above.

The three stars in a row mark the belt of Orion, the warrior. Of the two bright stars, the one to the right, which was placed in one of his feet in the old star maps, is called Rigel. The one to the left is Betelgeuse, in his shoulder. When he is seen in this part of the sky, Orion is on his back. He is upright when he climbs higher in the south.

The star above, which is distinctly red in hue, is Aldebaran, part of Taurus, the bull. And farther to the left (on the map of the northern half of the sky) is Capella, in Auriga, the charioteer. Below this constellation is a group called Gemini, the twins, whose brightest stars are named Castor and Pollux. Castor is of the second magnitude, and Pollux of the first. Both, however, are considerably dimmed because they are so near the horizon, and their light is absorbed by the atmosphere.

Turning toward the northwest two more bright stars are visible. The lower is Vega, in Lyra, the lyre, while the one above is Deneb, in Cygnus, the swan. Farther to the left, a little lower than Vega, is Altair, in Aquila, the eagle. Here again we have three stars in a row, but there is little chance of confusing them with Orion's belt, in which all three are of similar brightness. Altair, in the middle, is considerably brighter than its two companions.

Low in the southwest stands another first magnitude star, called Fomalhaut. This is about all that you can see of Piscis Austrinus, the southern fish. But the people in Buenos Aires see it much better, for it passes directly overhead.

Low in the north you can see the great dipper, which is part of Ursa Major, the larger bear. At this time of year the group is in its poorest evening sky position.

Above it is Polaris, the pole star, which is a part of the smaller bear, Ursa Minor. And still higher stands Cassiopeia, the queen, whose principal stars now form the letter M.

In addition to Jupiter and Saturn there are three other planets that can ever be seen with the naked eye. Two of them are visible in November before sunrise. Venus appears low in the southeast about an hour before the sun. It is even brighter than Jupiter, so is easy to see—if you look at the correct time and place.

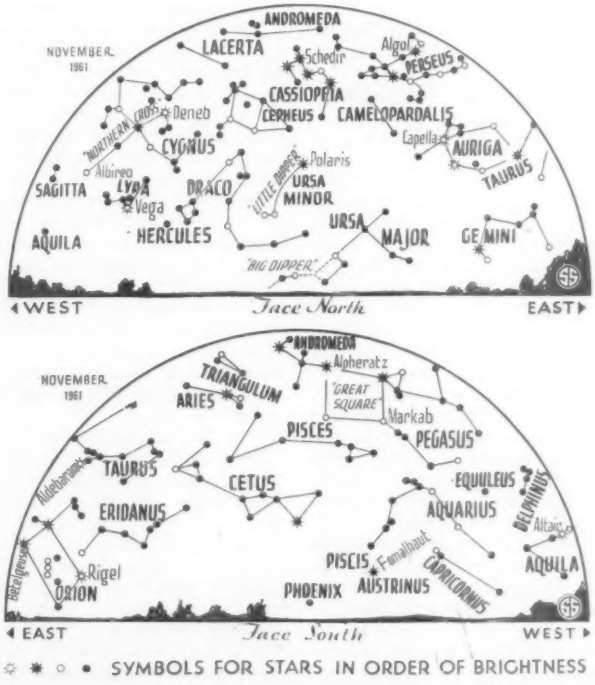
On Nov. 7 Mercury reaches "greatest western elongation," the position farthest west of the sun, and so rises a little before sunrise. For a few days around this date you may be able to see it, near Venus and considerably fainter, as dawn is breaking. Mars, the third planet, cannot be seen at all this month because it is too nearly in the same direction as the sun.

Mid-November is the time of one of the most famous of meteor showers, the Leonids. On any clear, dark night, if you watch the sky for a while, you will see a meteor, or shooting "star." Actually these are not stars at all—merely small bits of cosmic debris that enter the earth's atmosphere from outer space where they encounter so much friction that they burn up in the flash of light one sees.

During any night a single observer can see about seven such meteors per hour, on the avearage. There are always more after midnight than before; in the early morning hours we meet them head on, while those seen in the evening have to be moving fast enough to catch up to the earth.

These sporadic meteors may move in any direction across the sky. At certain times of year, as around Nov. 16, many meteors seem to radiate from one particular region. For the November meteors this is the constellation of Leo, the lion, which now rises around midnight.

The effect is actually one of perspective, for the meteors are moving around the sun in a huge swarm that follows the orbit of a comet last seen in 1866. The orbit of this swarm crosses the earth's path in mid-November.



Thus, every year at this time, we meet them coming into the earth's atmosphere in parallel paths. But, just as the parallel tracks of a railroad seem to converge in the distance, so do the tracks of light made by the meteors seem to converge. It happens that the point of apparent convergence is toward Leo, and that is why they seem to radiate from that part of the sky. They are therefore called the Leonid shower of meteors.

In some places the Leonid swarm is much more concentrated and when the earth encountered these in past years, there was a shower of meteors of extraordinary brilliance. One of them was in 1833, the "year the stars fell on Alabama." This year, however, about Nov. 16, you should see an average of 15 to 20 meteors an hour, including the strays that do not belong to the shower. There will be more after midnight. Not only will we then be able to meet them head-on, but the moon will then have set. It is at first quarter on the 15th, when it sets about midnight.

Celestial Time Table for November

Nov.	EST	
1	9:00 p.m.	Moon farthest; distance 251,300 miles
6	11:00 a.m.	Moon passes Venus
	1:00 p.m.	Moon passes Mercury
7	10:00 a.m.	Mercury farthest west of sun; visible for a few days around this date in southeast just before sunrise
8	4:59 a.m.	New moon
12	3:30 a.m.	Algol (variable star in Perseus)) at minimum brightness
13	8:00 a.m.	Moon passes Saturn
	7:00 p.m.	Moon passes Jupiter
15	12:19 a.m.	Algol at minimum
	7:13 a.m.	Moon at first quarter
16	early a.m.	Leonid meteor shower at best (see text)
	12 midnight	Moon nearest; distance 229,700 miles
17	9:08 p.m.	Algol at minimum
20	5:57 p.m.	Algol at minimum
22	4:44 a.m.	Full moon
29	5:00 p.m.	Moon farthest; distance 251,200 miles

Subtract one hour for CST, two hours for MST, and three hours for PST.

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Questions

ASTRONOMY—On what date does Mercury reach its greatest western elongation? p. 290.

NEUROLOGY—What substances were injected into the brain during surgery for epilepsy? p. 283.

SPACE—How much will the first Saturn rocket weigh? p. 287.

Photographs: Cover and p. 287, National Aeronautics and Space Administration; p. 283, Picker X-Ray Corporation; p. 285, Battelle Memorial Institute; p. 296, General Electric Company.

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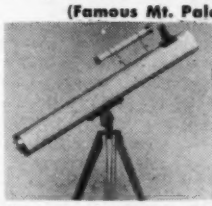

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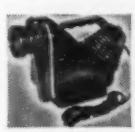

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AGING: A Regional Appraisal—Carter C. Osterbind, Ed.—*Univ. of Fla. Press*, 169 p., paper, $3. Papers presented at the Tenth Annual Conference on Gerontology, 1961, reporting on developments and activities in the southern United States.

THE BIRTH OF BROADCASTING—Asa Briggs—*Oxford Univ. Press*, 425 p., illus., $10. First part of a three-volume history of broadcasting in the United Kingdom, largely concerned with the first four years of the BBC.

THE BOOK OF SEA SHELLS—Michael H. Bevans—*Doubleday*, 60 p., illus. by author, $2.95. Colorful and instructive guide for young collectors.

A BOOK TO BEGIN ON ELECTRICITY—Leslie Waller—*Holt*, unpaged, illus. by Laszlo Roth, $2.50. About the beginnings of electricity for the youngest readers.

CARBON-14 COMPOUNDS—John R. Catch—*Butterworths*, 134 p., illus., $5.50. A guide to the literature of carbon-14 preparation in the form of a series of reviews which deal with the scope and limitations of the various methods of carbon-14 labelling and measurement.

CAREERS FOR WOMEN IN THE BIOLOGICAL SCIENCES—Mary C. Murphy and others—*Women's Bur. (GPO)*, 86 p., illus., paper, 40¢. Information on training and job opportunities within the biological sciences where women as technicians and scientists have had notable acceptance and utilization.

THE CELL: Biochemistry, Physiology, Morphology, Vol. III: Meiosis and Mitosis—Jean Brachet and Alfred E. Mirsky, Eds.—*Academic Press*, 440 p., illus., $12. Contains major treatise on mitosis and the physiology of cell division by Daniel Mazia.

THE CONSERVATION OF WILD LIFE AND NATURAL HABITATS IN CENTRAL AND EAST AFRICA—Julian Huxley—*Unesco (Int. Doc. Serv., Columbia Univ.)*., 113 p., photographs, map, paper, $1.25. Report with recommendations on the position of African wildlife in relation to habitat, land-use, national park policies, and tourism.

COORDINATION OF INFORMATION ON CURRENT SCIENTIFIC RESEARCH AND DEVELOPMENT SUPPORTED BY THE UNITED STATES GOVERNMENT—*Committee on Government Operations, U. S. Senate*, 286 p., paper, free upon request direct to Committee, Washington 25, D. C. Report explores the effect of methods used in coordinating the mass of scientific information on current research and development work.

FUNDAMENTALS OF ELECTRICITY: TMI-Grolier Self-Tutoring Course—R. K. Moore and others, Eds.—*Teaching Materials Corp.*, 293 p., diagrams, boxed, $10. High-school course programmed for self-study through carefully graded sequence of material.

THE GREAT MATHEMATICIANS—Herbert Westren Turnbull, introd. by James R. Newman—*N.Y. Univ. Press*, 141 p., illus., $3.50. Short biographical history of mathematics, showing how a mathematician's use of his imagination, as well as his reasoning, leads him to new aspects of the truth.

HOW LIFE GOES ON—Irving Zeichner—*Practice-Hall*, 122 p., illus. by Janet McCaffery, $2.95. Explains for young people the many different ways in which molds, plants and animals reproduce themselves.

AN INEXPENSIVE SCIENCE LIBRARY: A Selected List of Paperbound Science Books—Hilary J. Deason and Robert W. Lynn—*AAAS*, 5th ed., 87 p., paper, 25¢. Selected, annotated and graded catalogue of 679 science books recommended for high school students, undergraduates, teachers and the general public.

JUNIOR SCIENCE BOOK OF ICEBERGS AND GLACIERS—Patricia Lauber—*Garrard Press*. 64 p., illus. by Evelyn Urbanowich, $2.25. Interesting and informative for young readers.

METABOLIC PATHWAYS IN MICROORGANISMS—Vernon H. Cheldelin—*Wiley*, 91 p., illus., $3.50. Presents recent work on the acetic acid bacteria, evaluation of metabolic pathways and carbohydrate metabolism.

NEEDED: A Ten Year College Budget—Sidney G. Tickton—*Fund for the Advancement of Education*, 40 p., worksheets, paper, free upon request direct to publisher, 477 Madison Ave, New York 22, N.Y. Discussion and ten-year projection of college needs, with case study.

A NEW MANUAL FOR THE BIOLOGY LABORATORY—Bernal R. Weimer, Earl L. Core and Roy B. Clarkson—*Wiley*, 3rd ed., 263 p., illus., paper, $4.25. Aid to student, teaching him to observe, experiment and analyze.

NIKOLA TESLA: Giant of Electricity—Helen B. Walters—*Crowell*, 189 p., illus. by Leonard E. Fisher, $3.50. Juvenile biography with glossary, index, bibliography and chronology.

1001 QUESTIONS ANSWERED ABOUT INSECTS—Alexander B. and Elsie B. Klots—*Dodd*, 260 p., photographs and drawings by authors and Su Zan Swain, $6. A wealth of authoritative information grouped by subject, with detailed index.

OUR AMERICAN WEATHER—George H. T. Kimble—*Indiana Univ. Press*, 322 p., illus. by Jean Paul Tremblay, paper, $1.95. Geographer's month-by-month comments on recurring weather patterns.

PHYSICIAN: Healer and Scientist—Dana W. Atchley—*Macmillan*, 129 p., $3.50. Physician tells young people about the training, responsibilities, practices and rewards of the medical profession.

PROCEEDINGS OF FIRST NATIONAL CONFERENCE ON THE PEACEFUL USES OF SPACE, Tulsa, Okla., 1961—Abe Silverstein, Chmn.—*GPO*, 184 p., illus., paper, $1.25. Panel discussions on NASA space flight programs, personnel for the space age, manned space flight and space science applications.

(Continued on page 294)

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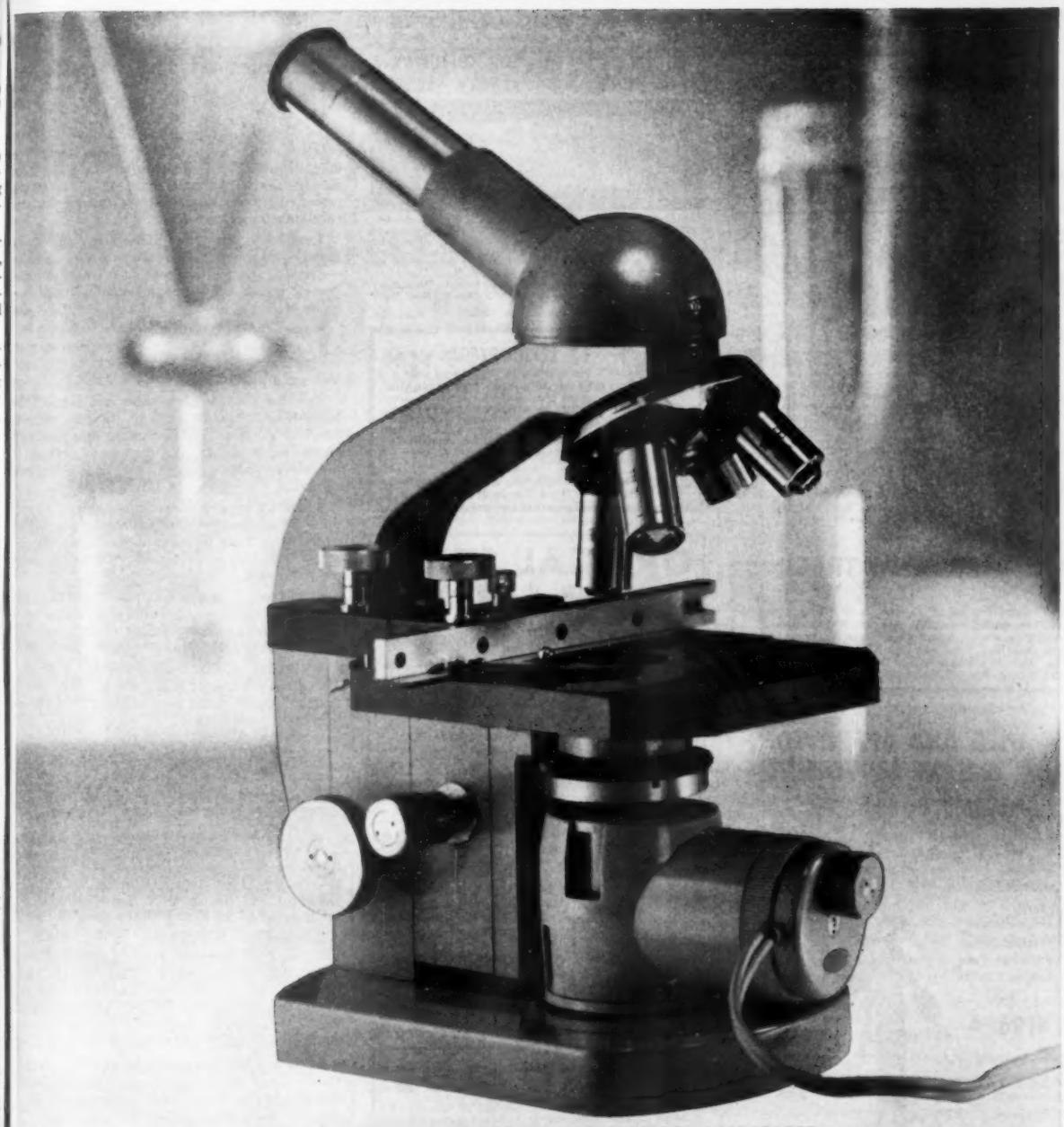

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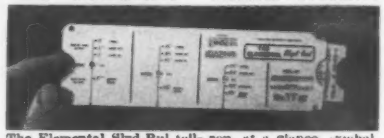

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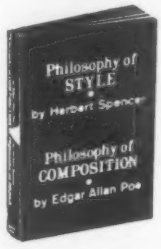

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Books of the Week

(Continued from page 292)

PROJECT IDEAS IN THE EARTH SCIENCES—*Geological Survey*, 16 p., paper, single copies free upon request direct to publisher, U.S. Dept. of the Interior, Washington 25, D.C. Describes subjects in the geologic sciences suitable for science club projects.

THE RIVER OF LIFE: The Story of Man's Blood, from Magic to Science—Bernard Seeman—*Norton*, 256 p., illus., $4.50. Traces for the general reader the history of man's knowledge of the blood.

SCIENCE IN THE CAUSE OF MAN—Gerard Piel—*Knopf*, 298 p., $5. Essays considering contemporary aspects of the sciences in the light of humanistic concerns.

THE SCIENCE OF LIFE—Lois and Louis Darling—*World Pub. Co.*, 256 p., illus. by authors, $4.95. Handsome book for young people, telling about the biosphere, the cells, organization of life, reproduction, geologic time, and the balance of nature.

SCIENCE PROJECTS HANDBOOK—Shirley Moore, Ed.—*Ballantine (Science Service)*, 253 p., illus., paper, 50¢. New printing of handbook describing actual science experiments of honors-winning students.

SCIENTIFIC CAREERS IN THE AGRICULTURAL RESEARCH SERVICE—Agricultural Research Service, Personnel Division—*USDA (GPO)*, rev. ed., 38 p., illus., paper, 35¢.

SCIENTIFIC EXHIBITS—Thomas G. Hull and Tom Jones—*Thomas, C. C.*, 126 p., illus., $6.50. Practical guide to the preparation of exhibits of scientific research, based on many years of professional experience.

SCIENTIFIC LIVING TODAY—Kay L. Ware and Gertrude B. Hoffsten—*Steck*, rev. ed., 160 p. illus. by Carol Rogers, paper, 72¢. Work text intended for 8th grade, with lots of material for practice.

SILKWORMS AND SCIENCE: The Story of Silk—Elizabeth K. Cooper—*Harcourt*, 160 p., photographs, $3. Tells with clarity the story of the silkworm and the industry that developed out of its culture.

SMITHSONIAN INSTITUTION: Annual Report of the Board of Regents, 1960—Leonard Carmichael, Sec.—*GPO*, 605 p., illus., $4.50. Contains reports on the origin and nature of the moon, navigation—canoes to spaceships, hailstorms, diamonds, magnetization of crystals, cotton fiber science and New World prehistory.

THIS IS OUR LAND—Josephine Van Dolzen Pease—*Rand McNally*, 62 p., illus. by Esther Friend, $2.95. Tells small readers facts about the United States.

TOBACCO IN THE UNITED STATES—Albert Doub, Jr. and Alice Wolfe—*USDA (GPO)*, 62 p., illus., paper, 40¢. Brief and comprehensive description of the various phases of the tobacco industry.

TRIUMPH: The Incredible Saga of the First Transatlantic Flight—Hy Steirman and Glenn D. Kittler—*Harper*, 200 p., photographs, map, $4.50. Describes the hazardous U.S. Navy seaplane flight across from Newfoundland to the Azores in 1919.

WONDERS OF OUR NATIONAL PARKS—Peter Thomson—*Dodd*, 63 p., photographs, $2.95. Highlights from the American treasury of natural wonders.

THE WRIGHT BROTHERS AT KITTY HAWK—Donald J. Sobol—*Nelson*, 143 p., illus. by Seward Mackenzie, $2.95. Juvenile biography covering the three years preceding the first successful flight in an airplane.

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- Manual "Brainiacs—Small Electric Brain Machines—Introduction and Explanation" by Edmund C. Berkeley.
- "Introduction to Boolean Algebra for Circuits and Switching" by Edmund C. Berkeley.
- "How to Go from Brainiacs to Automatic Computers" by Edmund C. Berkeley.
- List of references to computer literature.

BRAINIAC KIT K18 . . . the kit with limitless possibilities—backed by an organization of 12 years standing in the computer field—$18.95. (For shipment west of Mississippi, add 80¢; outside U. S., add $1.80.)

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New Ideas and Gadgets

For sources of more information on new things described, send a self-addressed stamped envelope to SCIENCE NEWS LETTER, 1719 N St., N.W., Washington 6, D. C., and ask for Gadget Bulletin 1115. To receive this Gadget Bulletin without special request each week, remit $1.50 for one year's subscription.

FALLOUT SHELTER RADIATION DETECTOR climinates the need to go outside the shelter to check radiation levels. Waterproof and resistant to ordinary hazards, the battery-run detector is mounted outside the shelter and connected by a 50-foot cable to an indicator within. The instrument dial is read directly with dangerous radiation levels shown in red.

• Science News Letter, 80:296 October 28, 1961

COMPACT TRANSISTOR CHECKER weighing less than two pounds allows the researcher or technician to evaluate any general purpose, audio, low power and switching transistors of both NPN and PNP types by pushing a button and reading a meter. Useful for checking manufacturer's ratings, it will detect defective mechanisms and predict failure.

• Science News Letter, 80:296 October 28, 1961

PORTABLE CAR DESK with magnetic pencil is convenient for making notes in the car. Gripped between seat and back of the car, a continuous writing surface is supplied by 3½-inch adding machine tape which can be torn off or fed back into the desk as used. The cover opens to convenient storage sections.

• Science News Letter, 80:296 October 28, 1961

ELECTRONIC EYES, shown in the photograph, are highly sensitive cadmium sulfide photoconductive cells that react to varying light intensities. Available in four basic sizes, the cells can be used to turn on street lights, adjust lens opening of cameras, for blood pressure gauges, burglar alarms, headlight dimmers, radiation detectors and many other devices.

• Science News Letter, 80:296 October 28, 1961

MOON MODEL 12 inches in diameter and weighing ¾ of a pound is scaled to size and made of tough, washable plastic that can be marked without harm to emphasize any of the 30,000 formations shown. With proper lighting and rotation, moon phases can be shown. The half invisible from the earth is left blank to add any satellite information.

• Science News Letter, 80:296 October 28, 1961

DOG IDENTIFICATION TAG that will help assure protection to the animal is a heavy, chrome-plated metal disk 1¼-inches in diameter on which the pet's name, and owner's name, address and telephone number are deeply engraved. The tag attaches to the dog's collar with a hook.

• Science News Letter, 80:296 October 28, 196

OPTICAL STAR FINDER using an optical illusion enables the viewer to see a projection of a star chart, showing Orion, the Big Dipper, etc., on the sky superimposed over the corresponding star group. Battery operated for outside night use, the set includes the viewer, 30 circular charts of well-known constellations, and battery. Non-technical, the finder is easy to use.

• Science News Letter, 80:296 October 28, 1961

DISHWASHER SILVERWARE BASKET has a snap-on lid for the center of its three sections that will securely hold small items, such as baby bottle nipples and small plastic utensils, while allowing detergent and water to circulate freely within the basket. Self-standing, it can be loaded on the counter or table top.

• Science News Letter, 80:296 October 28, 196

Nature Ramblings

➤ WINTER is necessary for the survival of some plants. These include a number of perennials that require an interval of dormancy in order to survive. Their roots and tubers undergo a sort of hibernation that produces an effect of lifelessness.

A great many ornamental shrubs and trees meet the season of snows and freezing temperatures by losing leaves. This is a safety measure devised by nature, for death comes to plants during freezing temperatures if ice crystals form inside the leaves. The crystals are likely to penetrate the living cells of the leaves, and thus destroy them.

Many buds formed in the late autumn have to undergo a freeze if they are to open in the spring. The buds on a branch of forsythia cut and brought into the house before there has been a frost never open. But a branch cut in January or February and brought indoors will flower before spring.

Shrubs that retain leaves during winter

Plants in Winter

have a way of protecting themselves. The rhododendron rolls up its leaves when the temperature drops. On a bitter cold day, the leaves of this woody shrub are curled tightly. Such curling exposes less leaf area to the bite of winter winds and freezing temperatures.

Narrow-leaved evergreens cannot curl. But to protect the leaves of such trees in winter, nature provides a waxlike substance known as the "cuticle."

• Science News Letter, 80:296 October 28, 1961

Do You Know?

Pears, unlike other fruits, develop their best flavor and texture when ripened off the tree.

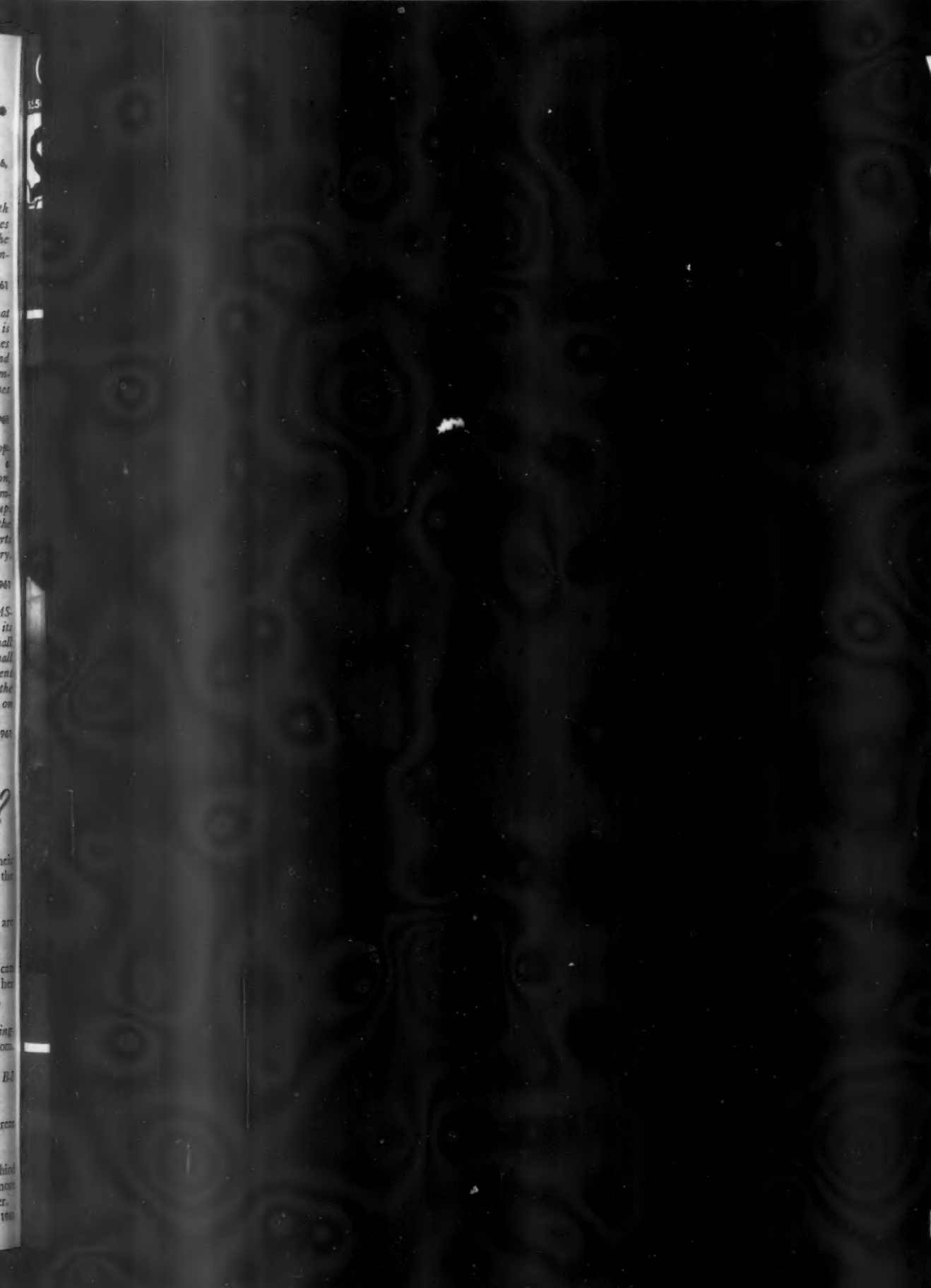
Half of the people in Latin America are without running *water* in their homes.

A young *woman* in the U. S. today can anticipate spending about 25 years of her married life working outside the home.

Relative to body weight, the *hummingbirds* have the biggest hearts in birddom.

Women over 50 require more *vitamin B-1* than do younger women.

Hawaii is one of the few rabies free areas in the Pacific.

The *Pacific* basin covers about one-third the surface of the earth and contains more than half the world's volume of water.

• Science News Letter, 80:296 October 28, 196